

Climate Change Adaptation in Hawaii: ICAP on Sea-Level Rise Policy Tools and Regulatory Takings

Hawai'i Ocean Resources Management Plan Working Group
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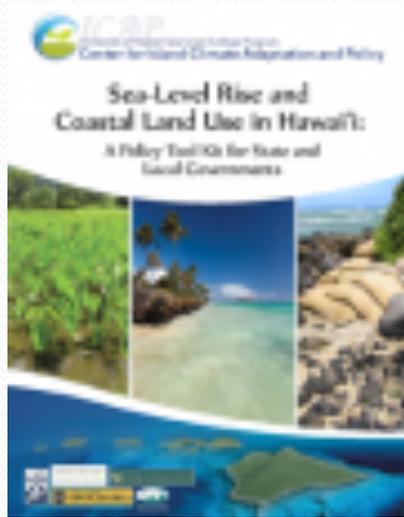
**CENTER FOR
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Recent ICAP Publications

Sea-Level Rise Policy Tool Kit

Regulatory Takings Paper

ICAP on Policy Tools for Sea-Level Rise



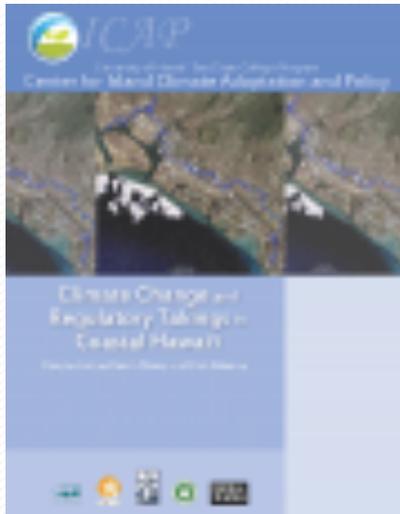
Sea-Level Rise and Coastal Land Use in Hawai'i:

A Policy Tool Kit for State and Local Governments

Center for Island Climate
Adaptation and Policy (2011)

Douglas Codiga and Kylie Wager

ICAP on Regulatory Takings



Climate Change and Regulatory Takings in Coastal Hawaii

Center for Island Climate
Adaptation and Policy (2011)

Douglas Codiga, Dennis Hwang and
Chris Delauney

Policy Tool Kit

Climate Science and Sea-Level Rise*

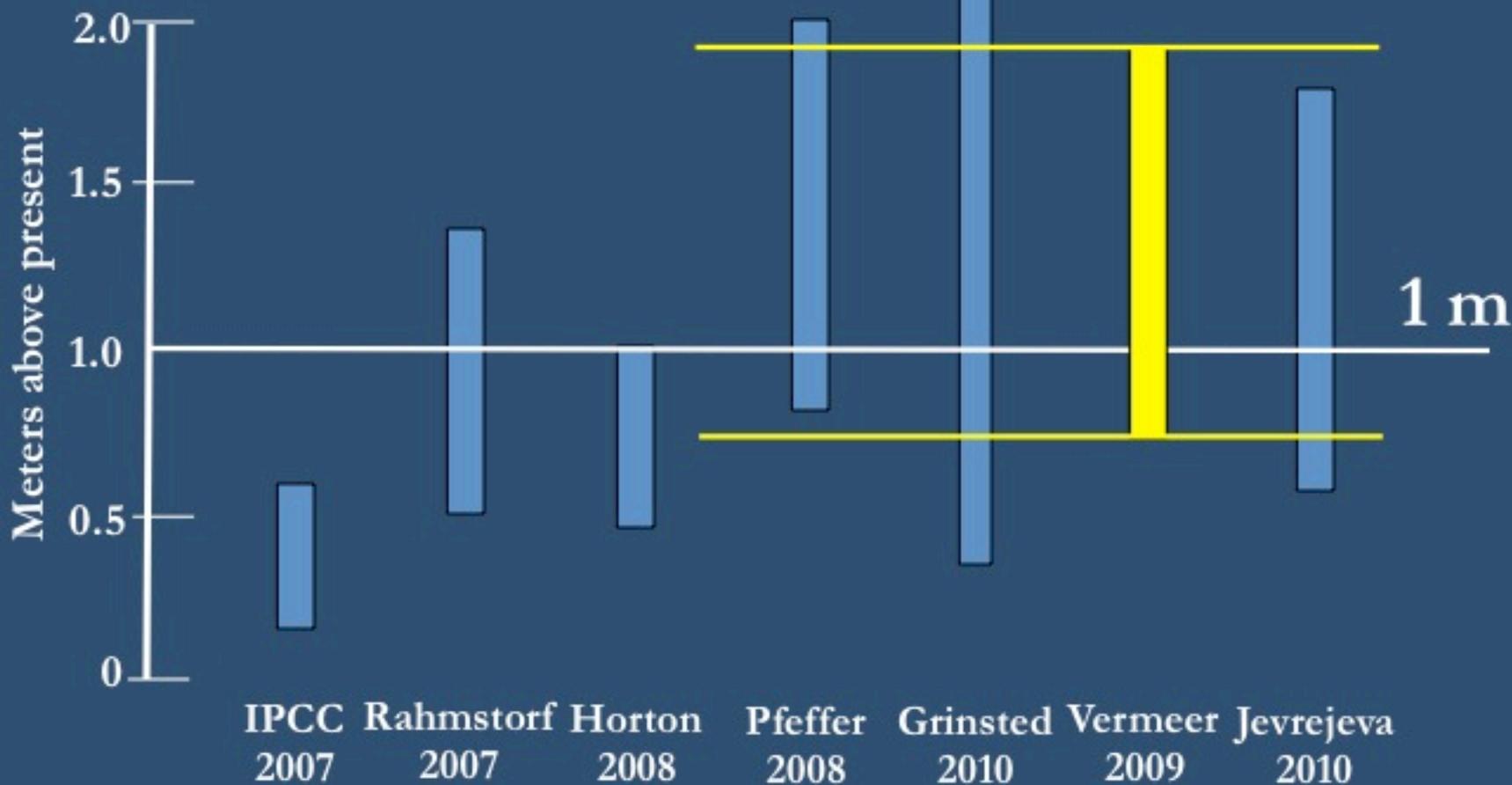
***DISCLAIMER: THIS IS FOR INFORMATIONAL AND EDUCATIONAL PURPOSES ONLY AND DOES NOT CONSTITUTE LEGAL ADVICE. FOR LEGAL ADVICE, CONSULT AN ATTORNEY**

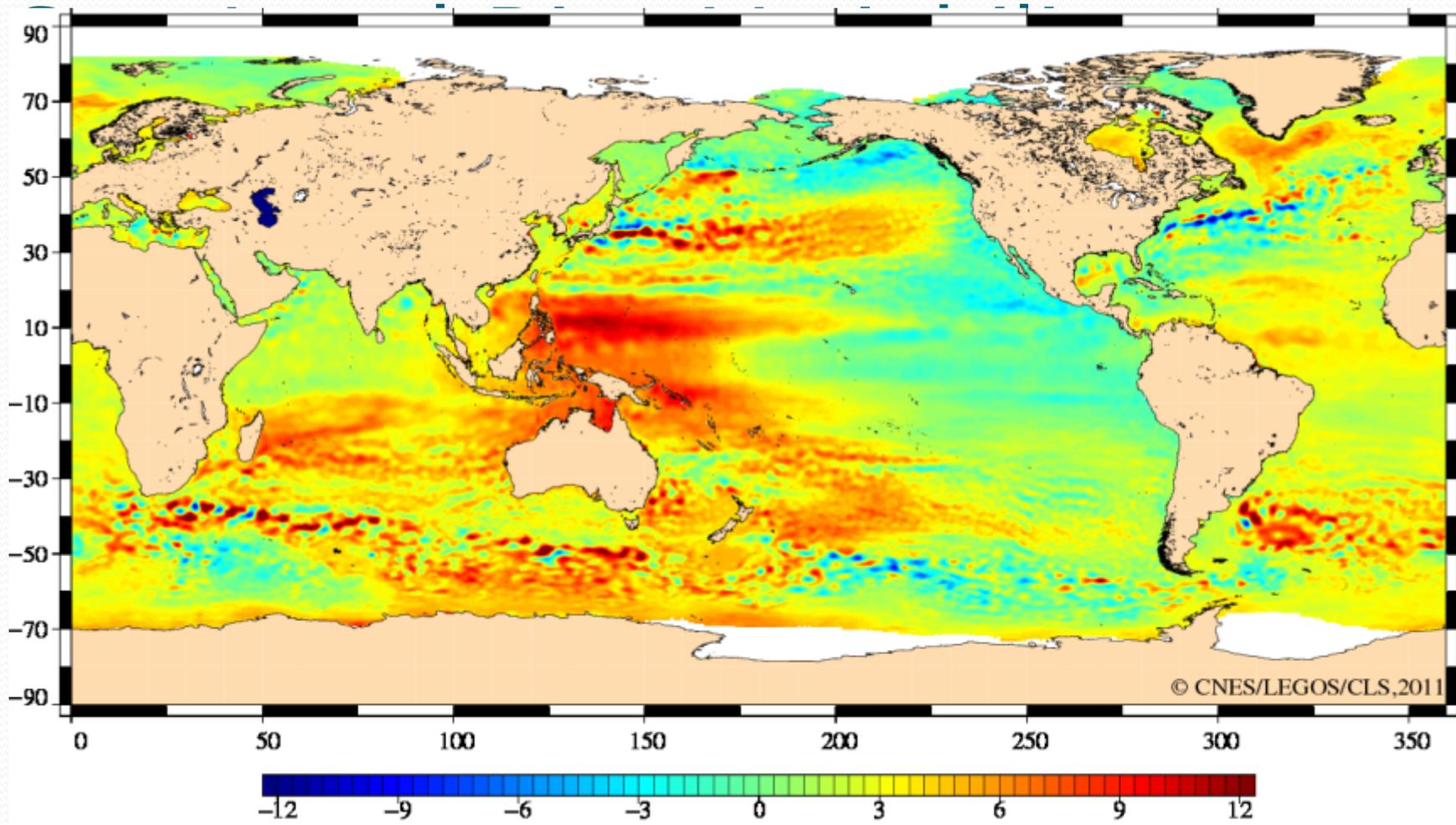
Hawai'i's Changing Climate

- Rainfall (-15%) and stream discharge have decreased
- Air temperature is increasing (0.30°F/decade)
- Rainstorm intensity has increased (+12%)
- Sea surface temperature is rising (0.22°F/decade)
- Ocean acidification is increasing
- Sea level is rising

Sea level Estimates – 2100

75 to 190 cm





Regional MSL trends from Oct-1992 to Dec-2010 (mm/year)

Sea-Level Rise in Hawai'i

A tropical beach scene with palm trees and a stone wall. The image shows a sandy beach in the foreground, a stone wall made of dark rocks along the shoreline, and several tall palm trees. The ocean is a vibrant turquoise color, and the sky is a clear blue with a few white clouds. In the distance, a small island is visible on the horizon.

1 foot by 2050

3 feet by 2100

Sea-Level Rise Impacts



- Increased vulnerability to coastal hazards
- High water events, wave inundation, hurricanes, tsunamis
- Increase flooding and drainage problems
- Increased coastal erosion
- Inundation of low-lying areas

Policy Tool Kit

Major Recommendations for
Government Action

SLR Benchmark

- Executive order directing state agencies to utilize sea-level rise benchmark of 1-foot-by-2050 and 3-feet-by-2100
- Build on existing agency use of similar benchmarks (e.g., USACE)
- Use for planning, permitting, decision-making
- Mandate government agency consideration of SLR

Expanded SLR Research

- Scientific research provides critical foundation for law and policy implementation
- Maps and models for site-specific impacts
- Funding for research
 - SLR variability
 - Risk and vulnerability assessments
 - Federal funding and partnerships
 - Outreach program

SLR Adaptation Lead Agency

- Increase interagency coordination and collaboration
- Increase access to scientific resources and information
- Create statewide vision, planning and research goals, data and information gaps, update SLR benchmark

Policy Tool Kit

- Planning Tools
- Regulatory Tools
- Spending Tools
- Market-Based Tools

Planning Tools



- Hawaii Coastal Zone Management Act
- Comprehensive Plans
- Pre-Disaster Mitigation Plans

Regulatory Tools

- Zoning and Overlay Zones
- Floodplain Regulations
- Shoreline Construction Setbacks
- Coastal Construction Control Lines
- Hard Armoring
- Rebuilding Restrictions
- Building Codes and Resilient Design



Regulatory Tools



- Subdivision Approvals
- Cluster Development
- Land Development Conditions
- Environmental Review
- Rolling Easement Statutes
- Non-Structural Armoring
- Buffer Zones

Spending Tools

- Capital Improvement Programs
- Land Acquisitions
- Conservation Easements
- Rolling Conservation Easements

Market-Based Tools

- Mandatory Real Estate Disclosures
- Tax Incentives
- Transfer of Development Rights Programs

Takings Paper

- Climate Change Impacts in Hawai'i
- Regulatory Takings Law
- Takings Analyses
 - Hazard-Based Planning and Regulating
 - Shoreline Setbacks
 - Shoreline Hardening
 - Flood Control, Rolling Easements and Managed Retreat



Takings Clause and *Lucas* Total Loss Test

Property "shall not be taken for public use without just compensation"

- Fifth Amendment to U.S. Constitution
- Hawaii Constitution Article I, section 20
- *Lucas* "total loss" test
 - Does not apply if property use is regulated by "background principles"
 - Nuclear plant on fault line
 - Grading causes flooding on neighbor's property

Penn Central 3-Part Test for Regulatory Takings

- Taking if regulation goes “too far”
Pennsylvania Coal v. Mahon (1922)
- *Penn Central* three-part test
 - Economic impact of regulation
 - Character of government action
 - Reasonable investment-backed expectations
- Role of Public Trust Doctrine



Mahalo

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